

## **Abstract of the Invention**

An imaging spectropolarimeter is provided for measuring the polarization and spectral content as well as the spatial signature of a target scene. The imaging spectropolarimeter may include an objective optic for receiving an electromagnetic signal and a modulator optically connected with the objective optic for modulating the electromagnetic signal whereby a modulated electromagnetic signal results wherein the amplitude of each frequency component of the modulated electromagnetic signal is a function of the particular polarization state of each frequency component of the electromagnetic signal. A linear polarizer may be configured to pass a single polarization of the modulated electromagnetic signal through an output thereof. A tunable filter may be optically connected to receive the single polarization of the electromagnetic signal and may be tunable through a frequency spectrum. The tunable filter may be configured to output a plurality of electromagnetic signal samples at predetermined frequency increments. A focal plane array may be configured to receive each electromagnetic signal sample and output a spectrum signal and a processor may be configured to apply Fourier transformation to the spectrum signal to obtain at least one Stokes polarization vector component for each pixel within the scene.